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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/774,683	02/10/2004	Jennifer Hoyt Lalli	05500008US	7374

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01/24/2007

EXAMINER
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TRAN, THAO T

ART UNIT	PAPER NUMBER
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1711

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/24/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

**Application No.**

10/774,683

**Applicant(s)**

LALLI ET AL.

**Examiner**

Thao T. Tran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 49-88 is/are pending in the application.
- 4a) Of the above claim(s) 49-68 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 69-88 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☒ Interview Summary (PTO-413)  
Paper No(s)/Mail Date 10/11/06.
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/02/2006 has been entered.
2. Claims 49-88 are currently pending in this application. Claims 49-68 have been withdrawn as directed to a non-elected invention as indicated in the Office action of 6/05/2006.
3. In view of the prior Office action of 6/05/2006, the objection and the 112 rejection of claim 79 have been withdrawn due to the Amendment made thereto. The 102(e) rejection of the claims has also been withdrawn due to the Amendments thereto. The 103 rejections of the claims are maintained below. New 112 rejection and 103 rejections of the claims are also included.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 69-88 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed

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invention. The amended claims, at least in claims 69 and 82, introduce the newly added limitation, “at least one polymer species”, that does not have adequate support in the specification as originally presented. The specification does provide a few species of the polymer. However, by stating “polymer species”, the claims include all species in a genus.

***Claim Rejections - 35 USC § 103***

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 69-88 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. (US Pat. 6,592,945).

Suzuki discloses a method of manufacturing a structure, comprising forming a layer of a crosslinkable polymer on a substrate, depositing metal nanoparticles on the polymer film, repeating the process multiple times to form a laminate of multilayers of the polymer and the nanoparticles, and curing the layers with heat or light (see Example 3; col. 2, ln. 57-59). The crosslinkable polymers include all the polymers as presently claimed (see col. 4, ln. 59-65). The nanoparticles include those recited in the instant claims, such as gold having an average diameter of 3 nm (see col. 3, ln. 14-19; Example 3).

The method employed by Suzuki to deposit the metal nanoparticles is sputtering or chemical vapor deposition, and not immersing. However, it would have been obvious to one of ordinary skill in the art to employ immersion to deposit the metal particles because that these deposition methods have been conventionally used as a substitute for one another.

Although Suzuki does not specifically disclose the polymer layers to be abrasion resistant, since the reference uses the same polymers as recited in the instant claims, the layer would inherently be abrasion resistant as presently claimed.

8. Claims 69-88 are rejected under 35 U.S.C. 103(a) as being unpatentable over Natan et al. (US Pat. 6,624,886), Natan et al. (US Pat. 6,242,264), or Natan et al. (US Pat. 6,025,202) in view of Meisenburg et al. (US 2004/0235997) or Suzuki et al. (US Pat. 6,592,945).

Natan '886 discloses a method for making a film of Au nanoparticles, the method comprising forming a monolayer of Au nanoparticles on a glass substrate coated with APTMS or MPTMS; immersing the monolayer in a crosslinker, 2-mercaptoethylamine. The surface is then immersed in a solution of Au nanoparticles for one hour. The process is repeated between 3-8 times, thus forming multilayers of the Au nanoparticles and the crosslinker. (See col. 4, ln. 53-60; col. 15, ln. 41-46; Example 6).

Natan '886 further discloses that the Au nanoparticles used can be coated with an organic or inorganic polymer (see col. 5, ln. 56-60). However, Natan '886 does not specify the type of polymer nor the curing step of the polymer to form an abrasion resistant layer.

Natan '264 and Natan '202 each disclose a method for producing a nanocomposite film, comprising forming a multilayer on a substrate; wherein the substrate is coated with an organosilane and the multilayer further includes Au colloid monolayers alternating with layers of 2-mercaptoethylamine as a bifunctional crosslinker. The colloidal Au solution contains Au particles and APTMS (see Natan '264, col. 38, ln. 43-53; Natan '202, col. 37, ln. 37-47), which reads on the presently claimed abrasion resistant resin.

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However, neither Natan '264 nor Natan '202 discloses the step of curing the abrasion resistant resin.

Meisenberg teaches a coating material comprising nanoparticles modified with a siloxane resin, which is cured by actinic radiation to undergo polymerization and crosslinking, for the purpose of enhancing heat and yellowing stability and moisture resistance (see abstract; paragraphs 0027, 0037, 0041, 0046, 0048). Therefore, it would have been obvious to one of ordinary skill in the art, to have employed the nanoparticles modified with a siloxane resin of Meisenberg in the invention of the Natan references, to improve heat and yellowing stability of the nanocomposite film.

Suzuki discloses a laminate comprising layers of Au nanoparticles and polysiloxane polymer, wherein the polymer is cured by heat or light, to provide diffusion suppression of the nanoparticles (see Example 3; col. 2, ln. 57-59). Therefore, it would have been obvious to one of ordinary skill in the art, to use the polysiloxane layers of Suzuki in the invention of Natan references, to improve dispersion of the nanoparticles in the polymer layers. Although Suzuki does not specifically disclose the polymer layers to be abrasion resistant, since the reference uses the same polymers, the layers would inherently be abrasion resistant as presently claimed.

### *Response to Arguments*

9. Applicants' arguments with respect to the 102(e) rejection as anticipated by Suzuki '945 are moot due to the withdrawal of the rejection.
10. Applicant's arguments with respect to the 103 rejections have been fully considered but they are not persuasive.

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11. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the Natan references disclose the nanoparticles being coated with organic or inorganic polymer. Miesenberg is used to illustrate that the use of a coating material comprising nanoparticles modified with a siloxane resin has been taught in the prior art. Suzuki is used to illustrate that a laminate comprising layers of metal nanoparticles and polysiloxanes polymer have been taught in the prior art. Thus, Miesenberg and Suzuki are used to remedy the Natan references.

12. Applicants' argument with respect to the Restriction requirement in the prior Office action is acknowledged. Applicants contend that since the originally elected claims 1 and 5 include the step of removing the resinous coating from the substrate, the elected invention includes a free standing film. This is not found persuasive because a free standing film has not been included in the original claims. Even if the step of removing the coating from the substrate has been included, this is not considered a final product being made.

The requirement is still deemed proper and is therefore made FINAL.

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***Contact Information***

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thao T. Tran whose telephone number is 571-272-1080. The examiner can normally be reached on Monday-Friday, from 9:00 a.m. - 5:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on 571-272-1078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Thao T. Tran  
Primary Examiner  
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